WEEDS and TURF

JANUARY
1964

The grass-roots magazine of vegetation management

Drift problems from helicopter applications may be ended with new type compounds. Story on page 12.

Spraying with the invert emulsions 12

Conferences galore are set for February . . 14

How to watch out for poor formulations 8

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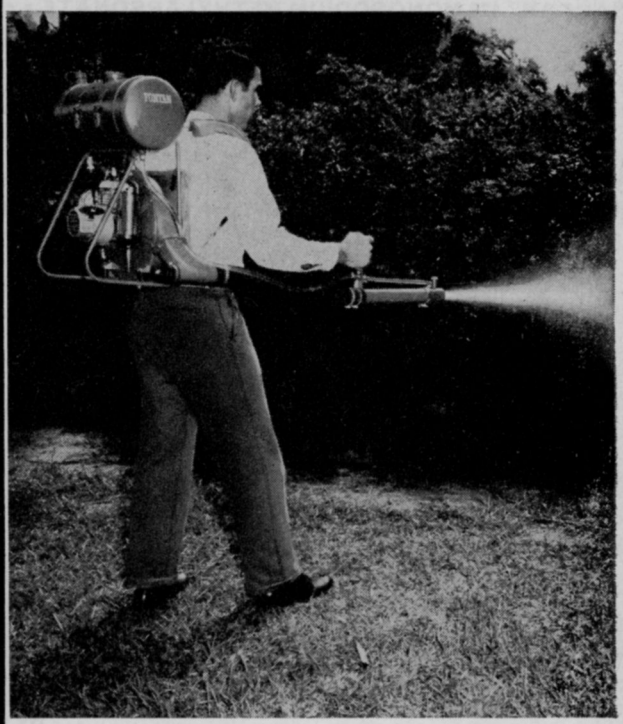

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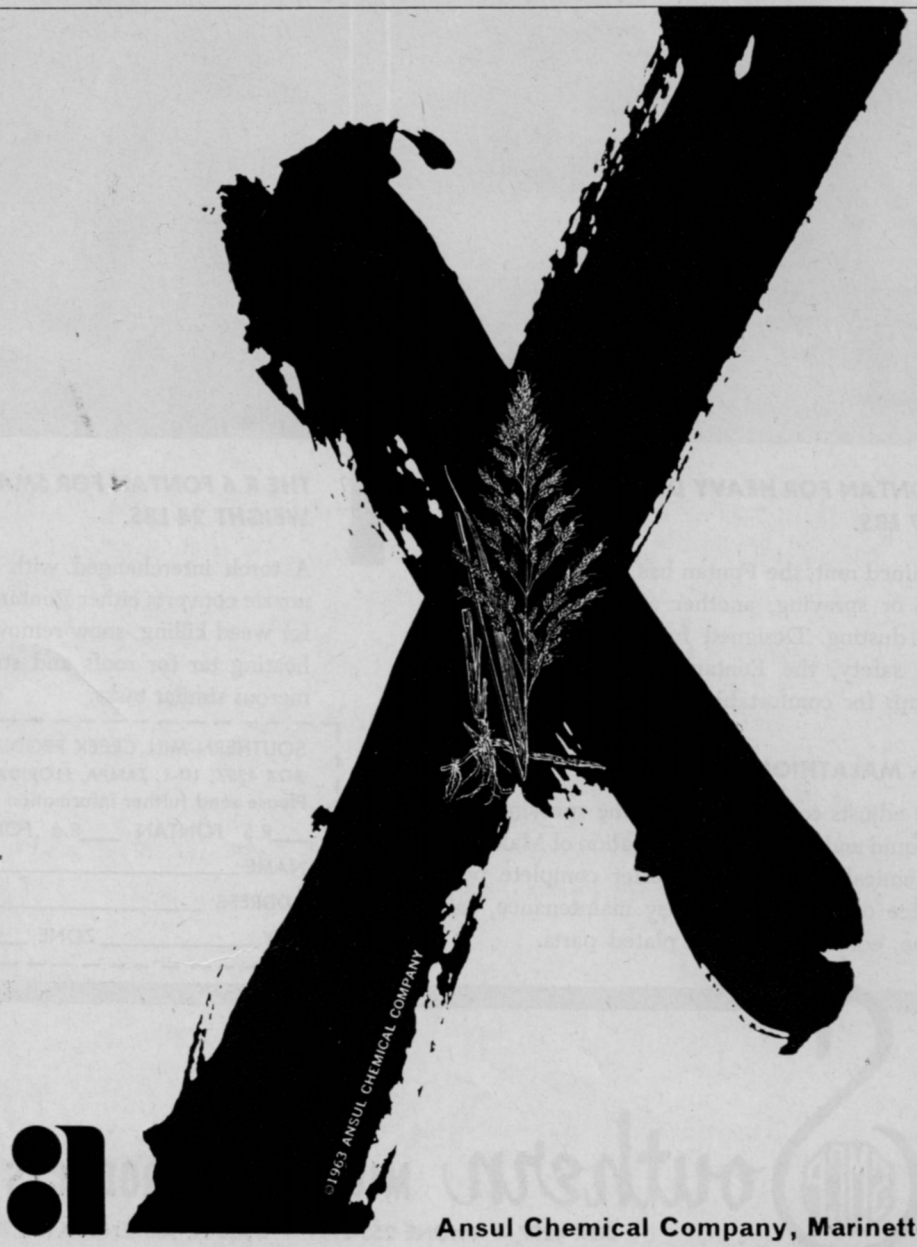

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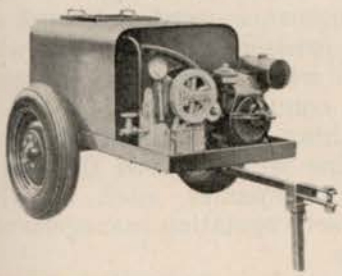

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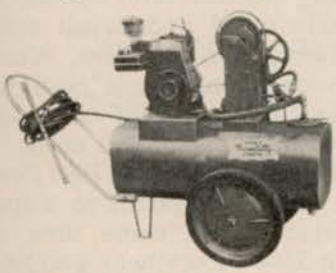

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WEEDS and TURF

January 1964 **Volume 3, No. 1**

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WEEDS AND TURF is the national monthly magazine of urban/industrial vegetation management, including turf maintenance, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

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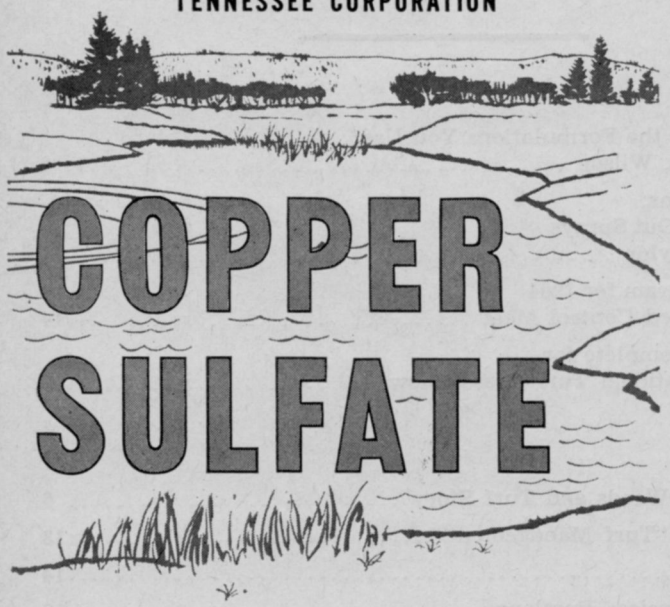

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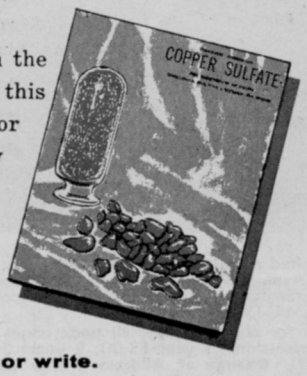

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The Weeds and Turf Story

This issue of *Weeds and Turf* is very special indeed: it marks the first time the magazine has appeared as a complete and separate publication from its "parent" journal, *Pest Control,* also published by Trade Magazines, Inc. of Cleveland.

More than a decade ago, Publisher James A. Nelson and his staff realized that many readers of *Pest Control* magazine were engaged in some form of "vegetation management," either as lawn spraymen, industrial weed controllers, or tree spray operators.

Always anxious to keep pace with reader needs, the staff began a long and detailed study of the industry, and ten years later (in July 1962) published the first issue of *Weeds and Turf Pest Control,* as it was then called.

But several unusual facts were discovered in the course of the study and preparation: for one thing, there are all kinds of companies which engage in turf maintenance, weed and brush control, and tree and ornamentals care, but which have no interest in what is generally known as the structural pest control industry.

And one other thing came to light: there was no national magazine which served the specific interests of these companies, each of which specializes in contract vegetation management of one kind or another.

Some called themselves horticultural spraymen; some custom sprayers; some were nurserymen who offer spray service; and others were arborists who include weed and brush control, and tree spraying, among their services. What all these firms had in common was a need for a national voice, a monthly source of how-to-do-it information keyed to their on-the-job needs.

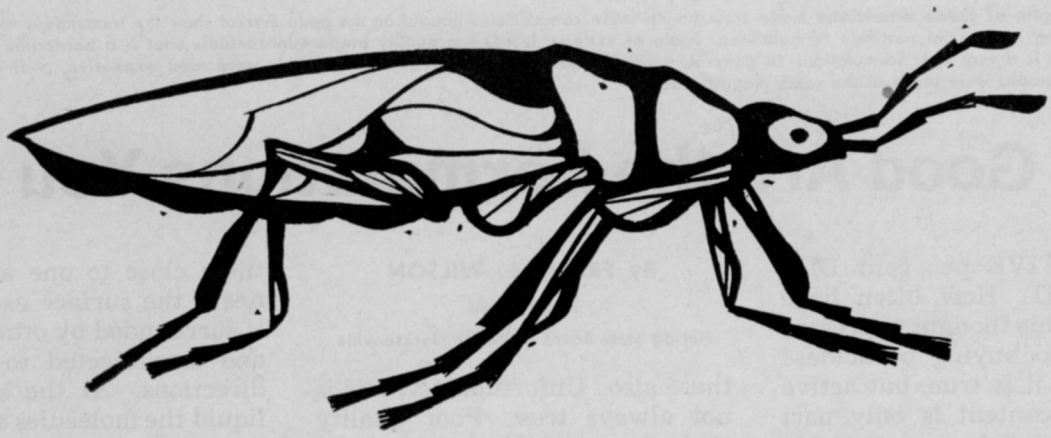
So from the start, *Weeds and Turf Pest Control* was bound into the parent magazine as a special section, and circulated at the same time, as a supplement, to about 2500 subscribers who had no interest in anything but vegetation articles.

As editorial concepts grew, as more and more reader response upheld the publisher's idea that this "weed, turf, and tree" industry needed its own magazine, it became evident that in the interests of all concerned, the new book should stand on its own feet, and W&T "came of age."

Circulation of this issue exceeds 8,500 copies! Who are your fellow readers? We characterize most of them as "contract applicators," though they may go by many names: what they have in common is their interest in controlling, enhancing, or changing vegetation in urban/industrial areas: whether it be weeds or turf or trees . . . brush or aquatic plants or shrubs.

Leading vegetation control supervisors with highway departments, railways, utilities, parks, etc., also read W&T; they have the same problems.

This first edition bears out the publisher's confidence in a dynamic and thriving industry. It's *your* magazine, and we will continue to serve all of you in the best way we know how!



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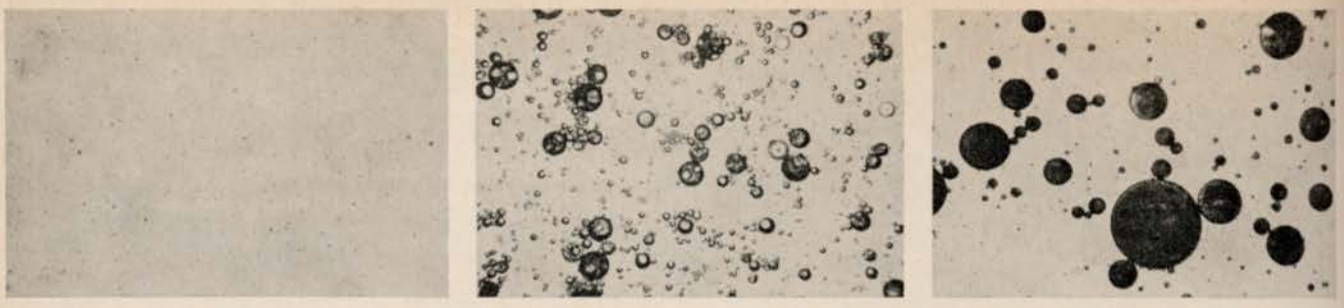


Photomicrographs of three emulsions made from emulsifiable concentrates bought on the open market show the tremendous variation in quality that exists among commercial pesticide formulations. Photo at extreme left is top quality preparation; middle shot is a borderline formulation; picture at far right is a very poor formulation. In general, author Wilson reveals, top quality materials were most expensive, poor quality cheapest. All these photographs were taken at the same magnification.

How Good Are the Formulations You Buy?

By FRANK L. WILSON
Entomologist
Florida State Board of Health, Jacksonville

TWENTY-FIVE per cent DDT is 25% DDT. How often have you heard this thought expressed in regard to buying pesticides? Chemically it is true, but active ingredient content is only part of the story of how a pesticide will perform. The physical characteristics of a formulation are just as important as its chemical content.

Our objective in lawn spraying is to bring a pesticide in contact with a pest in a manner that results in the control of the pest. For example, our major lawn pest in Florida is the chinch bug. We know that this insect is usually found in the stolon or runner portion of the St. Augustine grass mat. Therefore, to control this pest we must deposit our pesticide on this portion of the turf. We try to accomplish this by applying large quantities of spray to the grass leaves, so that runoff occurs and the spray travels downward to the stolon area.

Most of us have always believed that if the water portion of our spray reached a certain spot, insecticide was carried there also. Unfortunately, this is not always true. Poor quality "loose" emulsions deposit most of their pesticide content on impact or shortly thereafter. In lawn spraying these deposits are found on the grass leaves. These deposits are undesirable for several reasons. They are in a location where the fewest chinch bugs contact them, are subject to more rapid breakdown due to weathering, are removed by mowing, and increase the chances of human poisoning.

Variation in the quality of pesticide formulations is difficult to understand without some knowledge of surface active agents. "Surface active agent" is a broad term that includes emulsifiers, wetting agents, and spreaders.

These spray additives are necessary to overcome interfacial or surface tension. In liquids the tendency to pull together that exists between molecules keeps them close to one another. Beneath the surface each molecule is surrounded by other molecules and is subjected to pull in all directions. At the surface of a liquid the molecules are attracted inwards and to each side by adjoining molecules, but encounter little attraction from above. Above the liquid is air, in which the molecules are far apart and few in number. This gives very little outward pull to balance the inward pull, and every surface molecule, therefore, is subjected to a strong inward pull. This causes a contraction of the surface until it has become the smallest possible for a given volume. This phenomenon is the reason water forms round droplets when falling through space. This force is called surface tension when it is measured at the surface of a liquid or solid. It is called interfacial tension when it exists between two liquids, such as at the surface between water and oil.

It is common knowledge that oil will not dissolve in water. If two liquids, such as oil and water, which are almost entirely insoluble in each other, are agitated, one will momentarily become uniformly distributed through the other in the form of small globules. When agitation is terminated, the two liquids separate into distinct layers or phases. This separation is caused by interfacial tension.

Use of Emulsifiers

We can prepare fairly stable mixtures (emulsions) of such materials by adding surface ac-

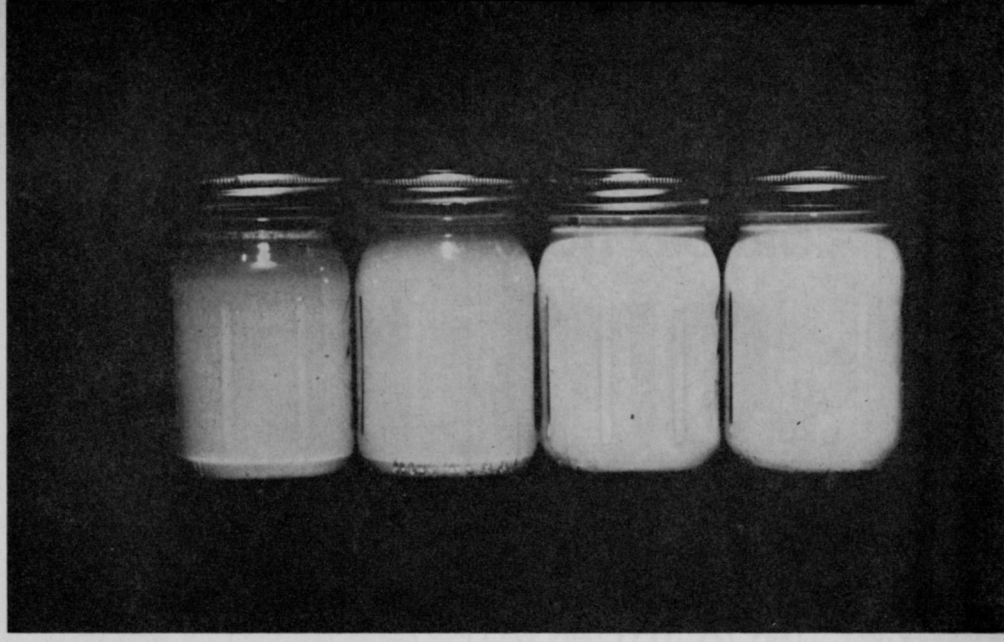
Why does a turf spray job go wrong? When it does happen, author Frank Wilson believes, it could be the result of an inferior chemical formulation. This article tells why faulty emulsions create headaches for contract applicators, and offers some quick and easy tests which determine how good a formulation really is. Entomologist Wilson, whose articles and speeches are ever popular with CAs, is well known in the spray industry.

tive agents, called emulsifiers. Emulsifiers consist of long chains of hydrocarbon molecules. One end of the chain is attracted to water, and the other end is attracted to oil. An emulsifier tends to lower interfacial tension by "coating" each of the globules that is formed with a colloidal or monomolecular layer. In other words, emulsifiers form a "shell" or "skin" around the oil globules. This "shell" acts as a "bridge" between the two liquids.

It is common knowledge that as materials are divided into smaller and smaller particles, the surface area increases. Because of this, more of a given emulsifier is required for a small globule-size, quality emulsion than is needed for a large globule-size formulation.

Pesticide globules within a spray droplet are deposited on a plant by one of two methods.

A spray consisting only of pesticide-oil-solvent and water will have the highest depositing ability, because the separation of oil and water, when it strikes the plant, would be unhindered by an emulsifier "shell" surrounding the oil globules. If an emulsifier is used in small quantities just sufficient to separate the pesticide-solvent into relatively large globules, the formulation is a quick-break or "loose" emulsion. In this type of formulation the emulsifier "shell" is weak and easily broken. When this type of formulation is sprayed on a plant, the emulsifier "shell" is usually broken by the spray droplet impact. This causes the pesticide to deposit at or close to the point of droplet impact.



Here's a simple comparison test applicators can use to see if formulations measure up to necessary standards of quality. The two products on the left are much poorer emulsions than the two products on the right. Details for using this test are spelled out in the article.

In the second type of deposition, the spray deposits its pesticide content when the water phase of the spray evaporates. This type of deposition is associated with strong emulsifier "shells" and small globule size, which is typical of the so-called "tight" emulsion. "Tight" emulsions are made by using large amounts of emulsifiers, so that the formulation will form small globules when it is mixed with water. In this type of emulsion the interfacial membrane is strong and will usually withstand spray droplet impact.

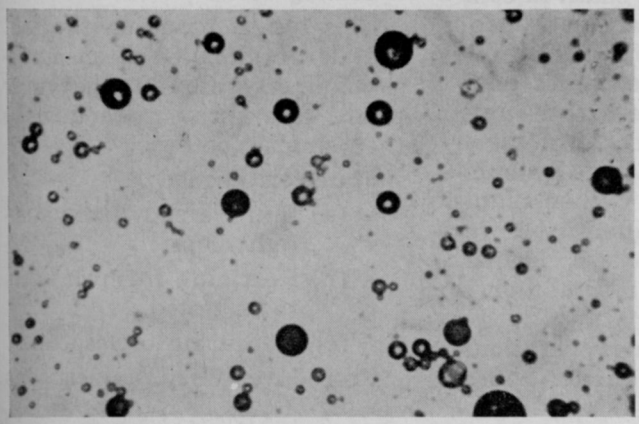
Emulsion-forming materials are the most widely used pesticide formulations in the horticultural spraying industry. These *emulsifiable concentrates* are clear pesticide-solvent-emulsifier solutions that, when added to water and agitated, are self-emulsifying. The globule size of the spray emulsion is dependent on the *kind and amount of emulsifiers* used.

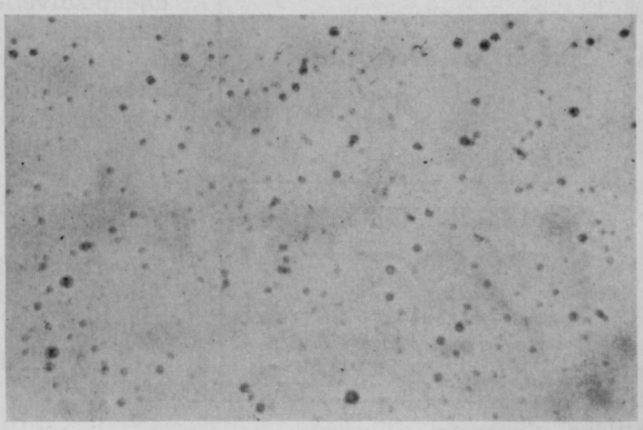
Concentrates Vary

The quality of commercially available emulsifiable concentrates varies widely. Poor quality most frequently occurs in those products that are highly competitive. Some companies have refused to make cheap materials. Others have met this problem by manufacturing two formulations, one quality and one for the price market. A few companies have specialized in price products. The major contributing factor to poor quality pesticide formulations is *price buying.*

Pesticide manufacturers are in

What happens to prepared sprays after they're applied? Below left is a sample formulation before it was applied to a St. Augustine lawn. Note the large particles. Below right is a sampling of the same spray after it was applied to St. Augustine turf. The droplet was recovered from the stolon or runner area of the grass. Notice the absence of large particles which were apparently deposited on the upper layers of turf, another reason to demand good, small-particle-size formulations.





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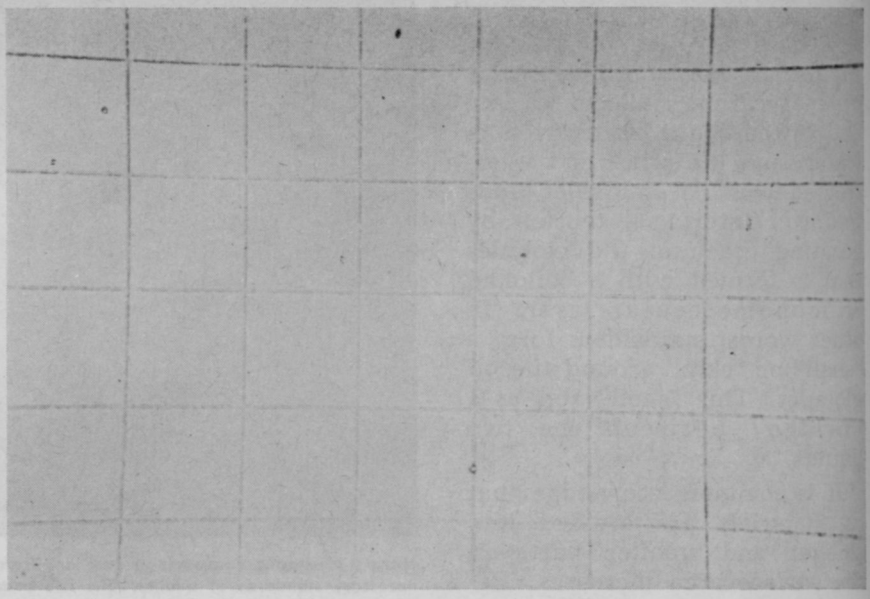

This ocular micrometer grid can be used to measure particle size of formulations as shown in the preceding photographs. Each square is equal to 1/125th of an inch.

business to make a profit, just as any other businessman. They supply what their customers want. We all know that it is difficult to buy a Cadillac for the price of a Chevrolet. With any product something must be cheapened if the price is to be reduced. In most states, some agency—usually the State Department of Agriculture—is responsible for testing pesticide formulations for active ingredient content as described on the product label. This testing is concerned with pesticide content only. Physical characteristics of a formulation are not checked. Therefore, the kind and amount of solvents and emulsifiers that are used in a formulation are decided by the integrity of the manufacturer and the market for which the product is intended. Solvents can play a major role in phytotoxicity or plant burn, but the savings that a manufacturer can make by using cheap solvents are small in comparison to those that can be made by cheapening emulsifiers. We have previously seen that quality, small globule-sized emulsions require more of a given emulsifier than a large globule-sized formulation. When emulsifier quality or quantity is reduced in order to sell cheaper, the quality of the formulation is reduced.

In lawn spraying operations, particularly for chinch bugs, nematodes, or grubs, the use of cheap pesticide formulations is usually false economy. Cheap formulations tend to deposit their pesticide content on spray droplet impact. This results in heavy pesticide deposits on the grass leaves, where chinch bugs, nematodes and grubs are seldom found.

Three Ways to Test Pesticide Quality

These tests are designed as comparison tests whereby you can compare one formulation with another. To be fair, restrict your comparisons to different formulations of the same pesticide. For example, compare company "A"'s 25% DDT emulsifiable concentrate vs. company "B"'s 25% DDT emulsifiable concentrate. Comparisons between different pesticides, such as Diazinon vs. chlordane, are usually misleading.

I. Settling Test

This test is based on the fact that large globules of an emulsion will separate from the water phase of a spray more quickly than small globules.

Materials needed:

(a) Pint jars with watertight caps.

(b) Pesticide formulations to be tested.

(c) Measuring tablespoon.

Procedure: Mix 2 tablespoons

Next month:

What Turfmen Should Know About Nematodes

of concentrate in 1 pint of water. Put the cap on the jar, and shake the jar 10 times. Place all test jars side by side for easy comparison. Observe for visible settling or layering at 5, 10, 15 and 30-minute and one-hour intervals. Any material which shows layering or settling within 5 minutes should be considered unsatisfactory. This layering may occur at either the top or bottom of the jar.

II. Comparison with Skim Milk

Milk consists of small globules of oil and fats suspended in a water phase. It is a "quality" emulsion that can be used as a standard for comparative purposes.

Materials needed:

(a) A piece of flat glass.

(b) Black background.

(c) Sunlight or a strong artificial light.

(d) Eye dropper.

(e) Skim milk.

Procedure: Place the glass plate on the black background. Mix the pesticides as described in the settling test. Place one drop of milk next to each drop of "spray mix." The more closely a formulation resembles milk, the better its quality. Materials which appear granular or gritty should be considered questionable.

III. Comparison of Globule Size (Optional)

(a) A few spraymen have *microscopes*. For these individuals it is easy to check globule size. Mix the pesticide in question as described in the settling test. Place a drop of the spray mix on a glass slide, cover with a cover slip, and observe with the microscope. One formulation can be compared to another very easily.

(b) *35 mm slide projectors* can also be used to compare globule size. Obtain a 2″ x 2″ glass slide binder for each formulation to be tested. Mix the pesticide as described in the settling test. Place one drop of "spray mix" on a 2 x 2 glass slide, then cover the drop with another 2 x 2 glass slide. Tape the two pieces of glass together.

Set up your slide projector so that the projected "picture" of a 35 mm slide covers an area 5 feet wide. At this distance your projector gives about 40-power magnification. Place the slides which have been prepared in the projector and focus.

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Anonymous. "Atlas Surface Active Agents," 1948, Atlas Powder Company, Wilmington 99, Delaware.

Anonymous. "Emulsions and Detergents," 1961, Union Carbide Chemicals Corporation, New York, New York.

Ebeling, Walter. "Subtropical Entomology," Lithotype Process Company, San Francisco, California, pages 183-196.

Frear, D. E. H. "Chemistry of Insecticides, Fungicides and Herbicides," D. Van Nostrand Company, Inc., New York, New York, pages 287-298.

Southern Weed Conference Set for Memphis, Jan. 15-17

"Winter Weed Removal from Dormant Turf," is one of several key subjects to be discussed at the annual Southern Weed Conference when it meets January 15-17 at the Heidelburg Hotel in Jackson, Miss.

Also of particular interest to urban/industrial vegetation managers are talks on "Tolerance of Warm Season Turf Grasses to Herbicides," by Dr. E. O. Burt of the Florida Agricultural Experiment Station in Ft. Lauderdale, and "Crabgrass Control in Turf," by three researchers from Virginia Polytechnic Institute, Blacksburg.

The Southern Weed Conference is open to all interested applicators, and others, who may obtain additional information by writing to James M. Brown, Chairman, Public Relations Committee, Southern Weed Conference, P.O. Box 12285, Memphis, Tenn. 38112.

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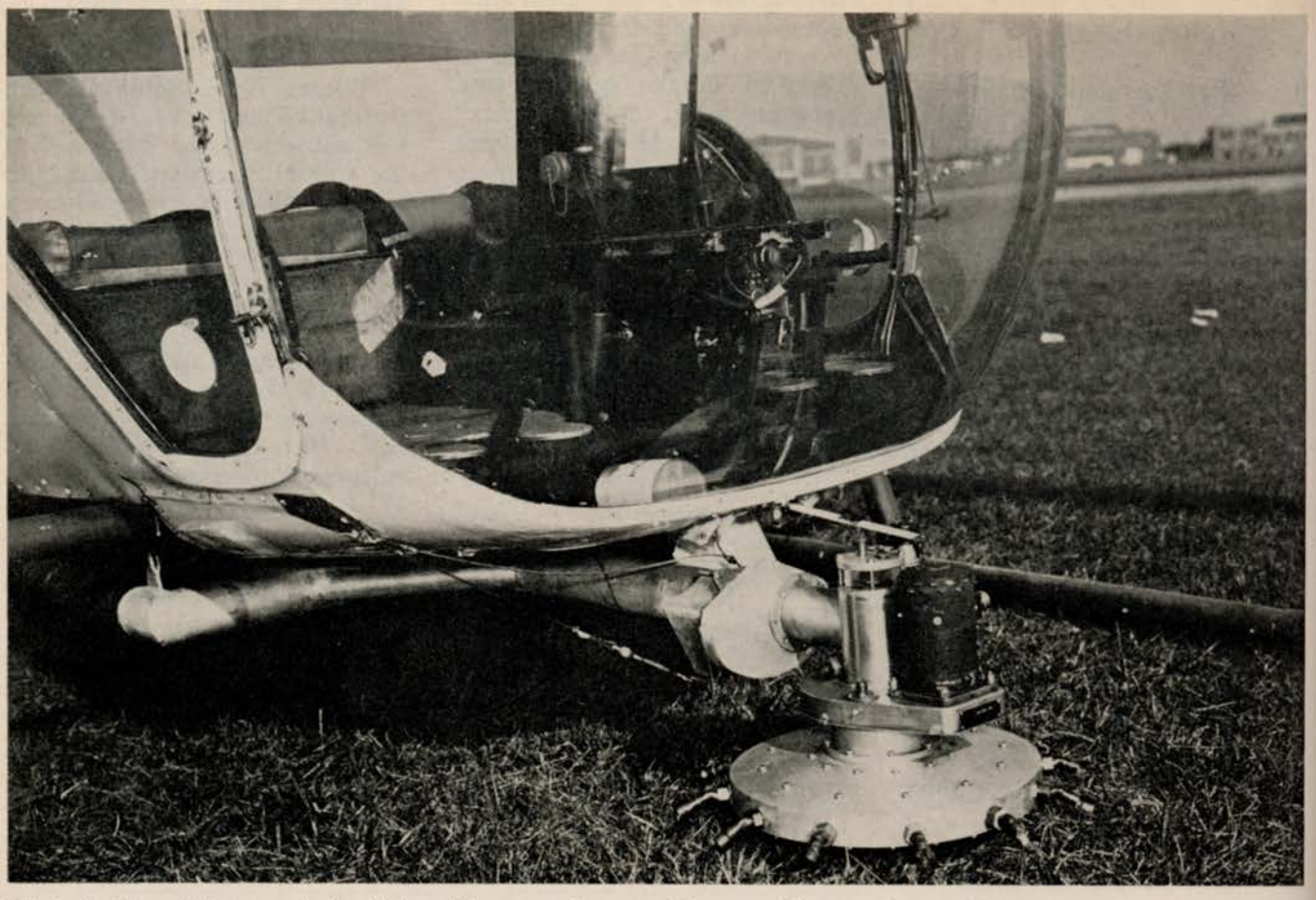

This typical Spra-Disk, an applicating device which accommodates use of invert emulsions, can be controlled by the pilot from inside his helicopter. Spray material is fed into the disk by gravity from saddle tanks mounted on both sides of the aircraft.

INVERT EMULSIONS:

The Inside-Out Sprays

EARLY one morning in May a helicopter took off from an isolated area in the West Virginia mountains. As the ship left the small clearing it headed toward a utility right-of-way which traversed the mountain range. As the aircraft approached the right-of-way the pilot performed a series of operations and suddenly a disk mounted under the ship's nose began spinning. At the same time large, white droplets began falling from the disk in a uniform, circular pattern. The droplets originated from nozzles mounted on the disk at set intervals. They were droplets of the "inside out" spray and were being applied to control woody vegetation on the right-of-way below.

By JACK TAYLOR
Amchem Products, Inc., Ambler, Pa.

The "inside out" sprays are actually a form of 2,4-D, 2,4,5-T or a mixture of both. They were born of a need which began back in 1949 when Amchem Products, Inc., developed the original formulations of these two herbicides.

2,4-D Heralds New Era

With the birth of 2,4-D and 2,4,5-T came a whole new era in the herbicide field. With them, also, came problems associated with any new ideas, the two most important of which were volatility and drift. Shortly after these discoveries, the same company succeeded in developing low-volatile formulations of these two herbicides. This solved the problem of volatility but the even more serious problem of drift remained.

With the problem of drift in mind this same company developed the "inside out" sprays, commonly called invert emulsions. Standard mixtures of 2,4-D and 2,4,5-T are normally formulated as oil-in-water emulsions. The inverts, on the other hand, are formulated as water-in-oil emulsions, hence the name "inside out" sprays.

Characteristic of the inverts is their tendency to thicken when water is added and they are agitated. When properly mixed they reach a consistency

approaching that of mayonnaise. In a like manner, these same invert emulsions become thinner as oil is mixed with them.

By their very nature the inverts appeared to offer a way of spraying with very little of the normal drift associated with 2,4-D and 2,4,5-T. The fact that they were thick and viscous meant there would be far less tendency for the material to break up when put through a sprayer. The sprayer, however, proved to be another problem.

Needed New Sprayer

It was learned quite quickly that conventional boom-type applicators as well as some modified types of these sprayers would not adequately disperse the inverts in their most desirable form. In order for them to pass through this equipment they have to be thinned which defeats the objective of providing a low-drift system.

Amchem conceived and engineered a radical new sprayer designed to retain the desirable, low-drift properties associated with a thick invert emulsion. This applicator was called a Spra-Disk* and was of a centrifugal type which was gravity fed. Mounted on a helicopter equipped with saddle tanks, it could be operated by the pilot and regulated to spray a variable-width swath. Since there were no pumps to change the viscosity of the material once it was in the helicopter's tanks, it could be applied through the disk in uniform, large droplets which had little tendency to break up and cause subsequent drift. With uniform viscosity and set nozzles, per acre rates are determined by the speed of the aircraft. Both the volume per minute and swath width vary with changes in rpm of the disk. The rate per acre is constant over the full range of swath widths when maintaining a constant forward speed.

Invert emulsions should be applied by trained, experienced pilots. The accuracy of these low volume application rates depends largely on the height and speed of the helicopter as well as the speed at which the disk is rotated, hence the pilot plays a major role in the successful application of them.

Good for Rights-of-Way

At the present time, the greatest use of the invert emulsion is in the control of woody growth on utility rights-of-way. Since many of these rights-of-way lie in areas where drift damage would be highly undesirable the invert emulsions fill an important need, as most conventional materials have proved unsuitable in these situations.

*Registered trademark, Amchem Products, Inc.

Pattern on these leaves resulted from an actual invert emulsion application. Note uniformity of the droplet pattern.

Book Review

Turf Management

by H. Burton Musser, McGraw-Hill Book Company, New York, N.Y. 1962, 356 pages, $10.95.

Who are universally respected for their knowledge of soils, grasses, and care and maintenance of turf? Greenskeepers, of course, whose successes with turf have inspired millions of homeowners to envy, and attempt to imitate, their lush fairways and neatly trimmed greens.

Now information about corrective turf treatment can be extracted from the standard text of greenskeepers and golf course superintendents. *Turf Management* by H. Burton Musser is newly available in revised form. Originally prepared in 1950 by Musser, of the University of Pennsylvania, and assisted by turf experts from all over the United States, this book will be useful to CAs in all parts of the U.S. as well.

Sponsored by the United States Golf Association, which spends a great deal of money each year for turf research, *Turf Management* will serve as a practical guide for all those working toward maintenance of large turf areas.

Soil acidity, porosity and microorganism content all play important roles in producing healthy turf. These categories are thoroughly discussed in layman's terms; though the author sometimes deals with technical material, he explains it simply and very clearly. Tests for various soil chemicals tell what other treatments should be made to maintain proper balance of minerals and plant food material. Functions of fertilizing and liming practices are outlined, and proper handling and application techniques are illustrated.

For those who want an automatic irrigation system, turf requirements and sprinkler systems are detailed along with general watering practices which are of general interest to everyone with a lawn maintenance business.

Although we are not all greenskeepers, this book should be placed high on any CA's reading list. *Turf Management* contains information clearly and concisely put for anyone involved in the management and correction of difficulties on large areas of turf.

Meeting Dates

Northeastern Weed Control 18th Annual Conference, Hotel Astor, New York, N.Y., Jan. 8-10.

National Arborists' Association Winter Meeting, Galt Ocean Mile Hotel, Fort Lauderdale, Fla., Jan. 12-14.

Southern Weed Conference, Heidelburg Hotel, Jackson, Miss., Jan. 15-17.

16th Annual California Weed Conference, El Rancho Hotel, Sacramento, Jan. 21-23.

35th International Turf-Grass Conference and Show, Sheraton Hotel, Philadelphia, Pa., Feb. 9-14.

Colorado Aerial and Ground Pesticide Applicator Workshop, Malibu Motor Hotel, Denver, Colo., Feb. 10-11.

Weed Society of America Biennial Meeting, Pick Congress Hotel, Chicago, Ill., Feb. 10-13.

Aquatic Weed Control Society Annual Meeting, Palmer House Hotel, Chicago, Ill., Feb. 11-12.

Southern Turfgrass Conference, Peabody Hotel, Memphis, Tenn., Feb. 24-25.

Cornell Turfgrass Conference, Cornell Univ., Ithaca, N. Y., Feb. 24-27.

Midwest Regional Turf Conference, Purdue Univ., Lafayette, Ind., March 2-4.

Iowa State Univ. Turfgrass Conference, Iowa State Univ., Ames, March 10-12.

34th Annual Michigan Turfgrass Conference, Michigan State Univ., East Lansing, March 12-13.

New helmsman for the National Arborists Association were recently elected for 1964. They include (left to right) Henry A. Morrison, Wilmette, Ill., secretary; Winston E. Parker, Moorestown, N.J., first vice president; Edwin E. Irish, Detroit, Mich., second vice president; John Z. Duling, Muncie, Ind., president; F. L. Dinsmore, St. Louis, Mo., immediate past president; Dr. Paul E. Tilford, Wooster, Ohio, executive secretary; and Freeman L. Parr, Hicksville, N.Y., chairman of the standard practices committee. Kenneth P. Soergel, Gibsonia, Pa., treasurer, was absent when photo was made.

Announce Program for 1964 Aquatic Weed Control Meet

Theme for the 4th Annual Aquatic Weed Control Society Meeting will be the identification of problem aquatic plants, spokesmen for the group told *Weeds and Turf* recently.

Increased attendance is expected at this year's get-together, to be staged at Chicago's Palmer House Hotel Feb. 11-12, since the Weed Society of America is convening that same week in the Illinois metropolis.

Separate sessions on opening day will focus on both emersed and floating weeds, and on submersed aquatic plants. Marginal growths will also be discussed as part of the overall examination of waterweed ecology.

Algae identification will be the subject of study during the first afternoon. Representatives of industry, research, and the applicating firms are expected to attend, and a question-and-answer period will give an opportunity for specific inquiries from any of these three fields of interest.

For more information, *Weeds and Turf* readers may write Dr. John Gallagher, program chairman for the event, at Amchem Products, Inc., Ambler, Pa.

WSA Biennial Conclave Set Feb. 10-13 in Chicago

One of the highlights of the 1964 series of conferences on weed control, the Weed Society of America convention, will meet Feb. 10-13 in the Pick-Congress Hotel, Chicago, Ill.

Program plans are now complete for the affair, which meets only every other year. Several sections of interest to commercial applicators and urban/industrial vegetation control supervisors are planned.

There are talks on industrial weed and brush control, weed control in turf, and aquatics.

More information is available from the Society's Treasurer-Business Manager, F. W. Slife, Dept. of Agronomy, University of Illinois, Urbana.

Expect 200 for Southern Turfgrass Meet in Memphis

This year's Southern Turfgrass Conference, set for the Peabody Hotel in Memphis, Tenn., Feb. 24-25, is expected to draw over 200 delegates.

"The A-B-C's of Better Bermuda Grass" and "Spraying for Better Turf," both by Dr. Ethan C. Holt, Texas A. & M. University, are among the varied subjects to be discussed.

Registration fee is $10 for nonmembers and $5 for members of the Association.

For more information, write Mr. Reg Perry, Secretary, Southern Turfgrass Assn., P.O. Box 7305, Memphis, Tenn.

Series on Insects Available

"Know Your Insect Enemy," a series of photographs and descriptions of many common insect pests, is now available from Union Carbide Chemicals Co.

Features of special interest to CAs include No. 1, red-banded leaf roller; No. 10, coddling moth; No. 12, fall armyworm; No. 13, the eastern tent caterpillar; No. 15, Japanese beetle; No. 16, grasshopper pests; No. 17, periodical cicada; No. 23, leafhoppers; and No. 29, salt marsh caterpillar.

To order copies of any of the above series, write Union Carbide Chemicals Co., 270 Park Ave., New York 17, N.Y., specifying which features are desired.

Another

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Reader Service

CLASSIFIED ADS

As an added service to our readers, classified advertisements will be accepted for publication beginning with the February issue. ■ Categories include Position Wanted, Help Wanted, For Sale, and Wanted to Buy. All copy subject to approval by our editorial and advertising departments. ■ The small charges for these ads are meant only to cover expenses, since the advertising is an aid to readers who wish to resolve individual business problems and projects. ■ Ads for February will be accepted through Jan. 10th. Thereafter, all copy must be received by the 5th of month preceding. ■ Rates: "Position Wanted" 5¢ per word, all other classifications, 10¢ per word. Minimum charge $2. ■ Address Classified Department, Weeds and Turf magazine, 1900 Euclid Ave., Cleveland, Ohio 44115.

Scientific Guide to PEST CONTROL OPERATIONS

By Dr. Lee C. Truman & Prof. William L. Butts

Published in cooperation with Purdue University

"Scientific Guide to Pest Control Operations" preserves, in durable book form, all 18 lessons for the widely heralded Correspondence Course in Pest Control Technology offered by Purdue University and originally published a lesson a month in Pest Control magazine. Every page has been reviewed and brought up to date with latest use-information, and is now available in this beautifully printed, extensively illustrated, easy-to-read manual everyone interested in urban/industrial insect or rodent control should have.

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Know Your Species

PURSLANE

(Portulaca oleracea)

Common purslane (1), sometimes called wild portulaca or pusley, is a succulent fleshy annual reproducing by seed (4) and stem fragments. It is common throughout the United States and Canada, found on rich soils in gardens, cultivated soils, waste places, and newly seeded lawns or bare areas in established turf.

Upon germination, when soils first warm in spring, purslane develops prostrate mats of growth from a central stem. Stems are thick, smooth, and watery with a reddish tinge somewhat like that of rhubarb. Stem tips may turn upward at the ends. Uncontrolled, matted growth of purslane may reach 1 foot or more diameter, provided there is no competition from grasses or other plants.

Fleshy leaves with smooth edges develop in clusters near ends of stems. Small yellow flowers (2) with five petals are found in the axils of leaves (where leaf joins stem), so they, too, are somewhat clustered. In their northern ranges, they bloom from early July to first frost, when they die.

Each of the mature seed pods (3) opens by a "dunce-cap" lid. Seeds are tiny, 0.7 mm. in diameter, and are glossy black, somewhat flattened, and not quite circular. When a seed pod is emptied into one's hand, seeds resemble very small buckshot.

Because plants are fleshy and succulent, mechanical removal is next to impossible. If plants are pulled from the soil, they may root again if left lying on the ground. If a plant in bloom is pulled up, it may continue to develop and set seed before it is completely desiccated.

Purslane resists drying during hot summer months and continues to grow when grasses have gone into a midsummer dormant state.

When preparing a seedbed where purslane seeds are known to occur, seeding in the fall will give grasses a better chance to resist purslane invasion the following spring.

Susceptibility to 2,4-D is classed by most workers as intermediate; the younger the weed, the better 2,4-D's effect. Purslane is easily controlled by 2,4,5-T and silvex. For preemergence control, Dacthal and Zytron are effective. Purslane offers no problem for such soil-applied herbicides as CIPC, endothal, mylone, sesone, simazine, and others.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

Plans Nearly Complete for 35th Int'l Turf-Grass Show

Officials in charge of the 35th International Turf-Grass Conference and Show, slated for Philadelphia's Sheraton Hotel Feb. 9-14, say arrangements are rapidly being completed for the annual affair, described as "the greatest show on turf."

Sponsored by the Golf Course Superintendents of America, the conference features educational lectures and discussions of interest to personnel from all phases of the professional turf management industry.

A highlight each year is the trade exhibit, which attracts elaborate displays from the major suppliers of chemicals and equipment for turf maintenance. Since Philadelphia is situated in the heart of the country's most populated areas, the 1964 exhibition is expected to be larger than ever, GCSAA spokesmen told *Weeds and Turf*.

During the educational portion of the convention, experts from several areas of turf technology will give delegates detailed advice. Subjects for study include aquatic weed control, winter damage problems, fertilizer behavior, and an illustrated address which will outline the history of turf maintenance in the U.S.

Turf managers outside the golf course industry may attend by paying the customary registration fee, according to Dr. Gene C. Nutter, GCSAA Executive Director. More information will be sent any interested applicators who write Dr. Nutter at P.O. Box 1385, Jacksonville Beach, Fla.

Dow Has Ornamental Carbamate

Formulations of a new organic carbamate insecticide, Zectran, especially adapted for use on ornamental plants, are being introduced by The Dow Chemical Co.

New formulations, trademarked Zectran 2E and Zectran 25W, are compatible with most commonly used insecticides and fungicides, Dow researchers report.

For more information on the new carbamate, write Agricultural Chemicals Div., The Dow Chemical Co., Midland, Mich.

Identify, Control Spider Mites

Spider mites, if left untreated, can quickly cover the sturdiest evergreen, according to William Hantsbarger, extension entomologist at Colorado State University, Fort Collins.

"Older or lower branches are usually attacked first," Hantsbarger reports, "but eventually the entire tree will be infested, needles will yellow, webbing will form around the base of needles, and branches turn brown and die."

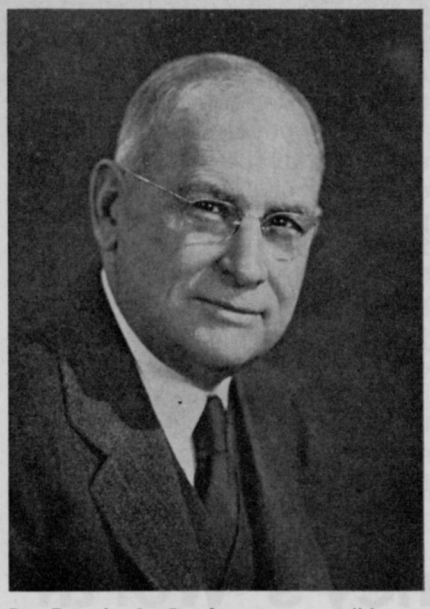
To check for spider mites, hold a sheet of white paper under a branch and rap the branch sharply. Any mites present will fall onto the paper, and can be easily identified as tiny red specks.

Miticides such as kelthane, dimite, and malathion have proven effective against spider mites, Hantsbarger reveals, and emphasizes that control is more effective when miticides are applied before spider mites build up in large numbers.

Earthworms May Plague Lawns

Mounds of soil, pushed up by earthworms, can make a lawn rough, difficult to cut, and uneven to walk on, Roland Portman, extension entomologist at the University of Idaho, Moscow, warns CAs.

"Several insecticides, including dieldrin and chlordane, have proven effective in controlling earthworms in Idaho," Portman reports. "Lawns can be protected by a 3-foot band of insecticide between lawns and gardens, which will prevent earthworms from invading lawns."



Dr. Francis A. Bartlett was a well-known scientific authority on tree care.

Dr. F. A. Bartlett, Pioneer Arborist, Is Dead at 81

Death has ended the long and noteworthy career of one of the world's foremost arborists.

Dr. Francis A. Bartlett, founder of the Bartlett Tree Experts, and chairman of its board since 1936, died at his home in Stamford, Conn. Nov. 21. He was 81.

The trail-blazing authority on trees was credited with the development of many modern methods and tools now standard in tree work, and was the first to successfully use chemotherapy in the treatment of vascular diseases.

A founder of the International Shade Tree Conference, Dr. Bartlett established the Bartlett School of Tree Surgery in 1923. He later inaugurated the Bartlett Tree Research Laboratories, a renowned research institute.

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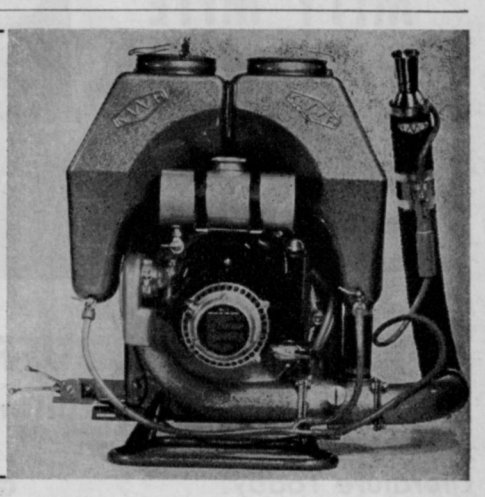

Winter Gives Trees Cankers

Severe winter conditions may lead to canker diseases in trees. This can occur on evergreens, especially Norway spruce and Colorado blue spruce.

Heavy snows pull the branches down so far that many small cracks develop under the bark, Dr. Robert Partyka, extension plant pathologist at Ohio State University, Columbus, reveals. Canker-causing organisms invade these areas under favorable conditions and infect the tissue. Later in the growing season, the needles begin to fall and the entire branch or tree may die.

Spraying evergreen trees with a solution of fixed copper (50%) at 4 lbs. per 100 gallons (2 tbs. per gallon) will help prevent infection, Dr. Partyka reports. This should be directed to the lower branches where most injury has occurred. However, the entire tree can be sprayed to give protection to other branches. Dr. Partyka says give several applications at 2-3 week intervals.

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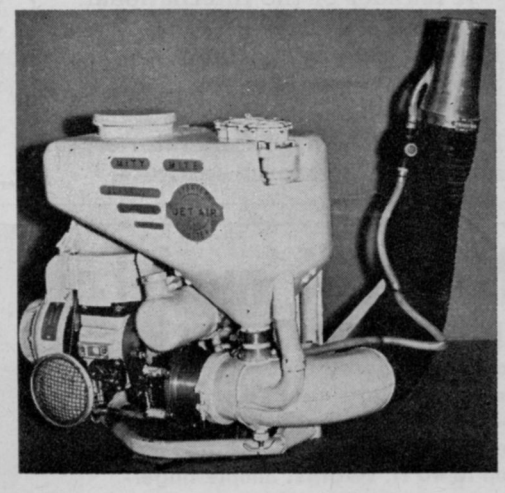

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—Trimmings—

Forest City Forester. What is more impressive, we wonder, than to be commissioner of shade trees in a community which, for more than a century, has been known as "the Forest City?" Such is the enviable status of John Michalko, charged with the responsibility of looking after thousands of trees on the shady streets of Cleveland, Ohio, which has long borne the "Forest City" nickname. John rejoices in his job, and is frequently seen at industry gatherings such as the International Shade Tree Conference and allied organizations. Most recently he was busy in St. Louis at the Plant Propagation Society, no doubt energetically keeping up with all that's new in his dual capacity of protector of old trees and grower of new (Cleveland has its own city nursery). Hats off to you, John, and all municipal foresters who keep America's cities cool and verdant.

* * *

What Fore? *Our editor's windows look out on snowy scenes these days, and when we were recently planning coverage of the forthcoming International Turf-Grass Conference and Show which meets Feb. 10-14 in Philadelphia, we wondered how some of the adamant golfers who attend this worthwhile meeting will occupy themselves this year, since Philadelphia's environs are not apt to be very conducive to 18 holes on a brisk and windy morn. Last year we met in San Diego . . . Ah! Golfers' Paradise! But too much weather like that, we rationalized, would spoil us all and keep us out of the lecture hall where some very informative talks are being delivered. So golfer or not, let's press onward to Philly for a week of study this February.*

* * *

Who's Your Hoosier? We nominate Dr. Donald Schuder, Professor of Entomology at Indiana's Purdue University, as "Hoosier of the Month." Not only is this expert on insects which attack ornamentals busy teaching classes, writing articles (one of which has appeared in *Weeds and Turf),* and doing research, but now we learn he's also Executive Secretary of the Indiana Nurseryman's Association. In the last capacity, he also edits the association magazine, and still finds time to correspond with us frequently with helpful suggestions and encouraging comments. But this is one Hoosier whose boundaries are not limited by Indiana's state line. Known all over the country among growers and guardians of plants, Don is frequently called on to speak at conferences and seminars, and has a vital interest in the trends and progress of the industry.

* * *

Goal for the soul. *Looks like the Cincinnati City Health Department has ambitious goals: they just requested the citizenry to get out and "grow grass and get rid of weeds" so the city can achieve improved health and beauty. Says the department: "A good example is good for the soul," so they urge neighbors to set examples for each other in cleaning up rampant and noxious plants.*

WEEDS!

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There's money in weeds, if you're on the right side of them. And that's with any of the many Du Pont weed and brush killers. They make custom weed control jobs easy and effective. Check the typical problems below; chances are you'll see at least half of them within a mile of where you're standing. ■ The answers are easy, too, because Du Pont has a product to meet almost any weed control situation you'll encounter.

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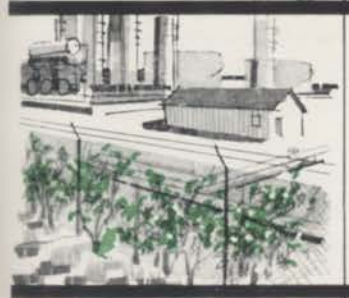

THE PROBLEM:
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THE ANSWER:
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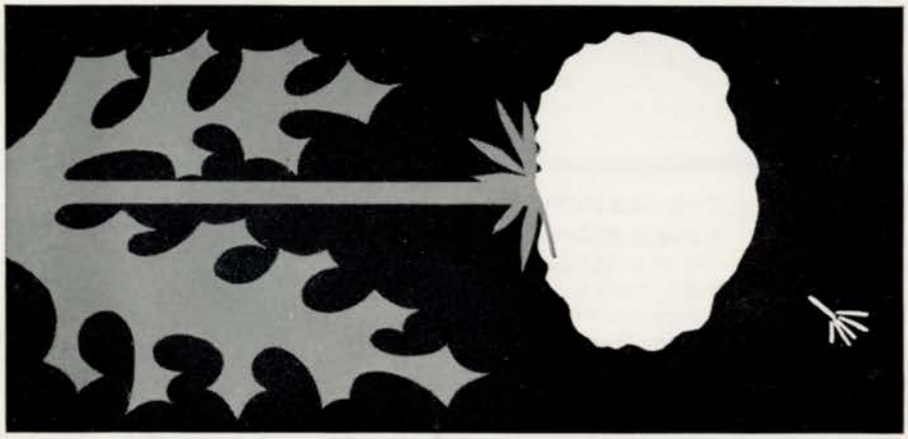

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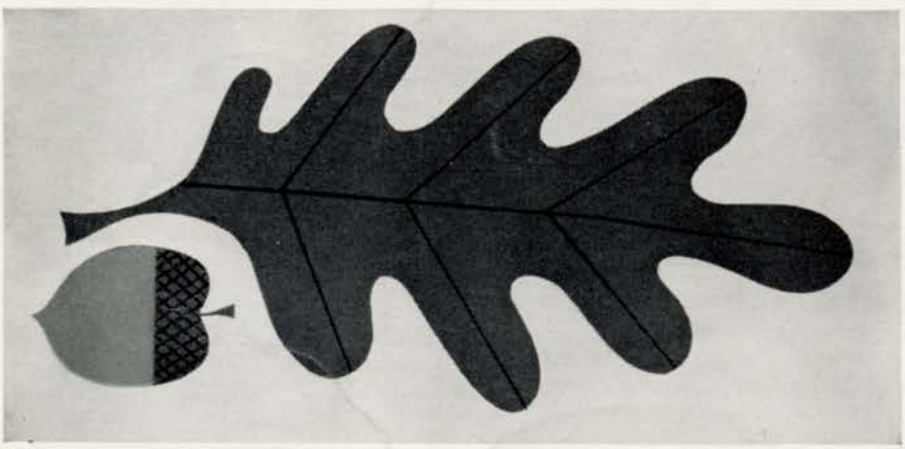

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year 'round program to kill weeds and brush

Proved in the laboratory, proved in field tests, proved commercially as to effectiveness, low cost of application, and practical timing—that's Diamond's position in herbicides for keeping unwanted vegetation from taking over.

New and exclusive from Diamond are Dacamine formulations of 2,4,5-T and 2,4-D for application near susceptible crops where even low-volatile esters may be risky. These new materials have the killing power of esters, with the safety of amines. For weed control in lakes, ponds, drainage and irrigation ditches and other water areas, the advanced method is use of Diamond Aqua Granular 20%, 2,4-D granules.

The Diamond aim is to keep ahead in keeping you ahead of unwanted vegetation. For technical information and application on these and other special formulations, write Diamond Alkali Company, 300 Union Commerce Building, Cleveland, Ohio 44114.

Diamond Chemicals

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